SANT NANDLAL SMRITI VIDYA MANDIR, GHATSILA

YEARLY SYLLABUS OF MATHEMATICS

SESSION – 2026-2027

STD – XI

MONTH	WORKING DAYS	TOPIC TO BE TAUGHT	ACTIVITY	LEARNING OUTCOME	VALUES & SKILLS IMPARTED	ASSESSMENT
APRIL	23	**1. Sets** Sets and their representations. Empty set. Finite and Infinite sets. Equal sets. Subsets. Subsets of a set of real numbers especially intervals (with notations). Power set. Universal set. Venn diagrams. Union and Intersection of sets. **2. Relations & Functions** Ordered pairs. Cartesian product of sets. Number of elements in the Cartesian product of two finite sets. Cartesian product of the set of reals with itself (R x R only). Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special type of relation. Pictorial representation of a function, domain, co-domain	To find the number of subsets of a given set and verify that if a set has *n* number of elements, then the total number of subsets is 2^n. To distinguish between a Relation and a Function.	Students will be able to : ● Define set as well-defined collection of objects ● Represent a set in Roster form and Set builder form ● Identify different types of sets on the basis of number of elements in the set ● Differentiate between equal set and equivalence set ● Enlist all subsets of a set	Relation and Function in real life give us the link between any two entities. In our daily life, we come across many patterns and links that characterize relations such as a relation of a father and a son, brother and sister, etc.	* Exercise Questions & Answers to be assessed * Questions from other reference books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked * Case-study based Questions will be asked

		and range of a function. Real valued functions, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum, exponential, logarithmic and greatest integer functions, with their graphs.		● Find number of subsets of a given set ● Find number of elements of a power set ● Express subset of real numbers as intervals ● Apply the concept of Venn diagram to understand the relationship between sets ● Solve problems using Venn diagram ● Perform operations on sets to solve practical problems ● Explain the significance of specific arrangement of elements in a pair		

				● Write Cartesian product of two sets ● Find the number of elements in a Cartesian product of two sets ● Explain the significance of specific arrangement of elements in a pair ● Write Cartesian product of two sets ● Find the number of elements in a Cartesian product of two sets ● Define and illustrate different types of relations: Empty relation		

				and universal relation ● Examine whether the relation is equivalence or not ● Define function as a special type of relation ● Categorize relations that are functions and non-functions		
MAY	08	**3. Complex Numbers** Need for complex numbers, especially$\sqrt{-1}$, to be motivated by inability to solve some of the quadratic equations. Algebraic properties of complex numbers. Argand plane. Statement of Fundamental Theorem of Algebra, solution of quadratic equations (with real coefficients) in the complex number system	To interpret geometrically the meaning of $i = -1$ and its integral powers.	* Differentiate between Real and Imaginary Numbers * To plot Complex Number on Argand Plane * Find the solution of Quadratic Equations	Improving Students' Algebraic Skills in the Learning of Complex Numbers	* Exercise Questions & Answers to be assessed * Questions from other reference books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked

						* Case-study based Questions will be asked
JUNE	11	**4. Sequence and Series** Sequence and Series. Arithmetic Progression (A. P.). Arithmetic Mean (A.M.) Geometric Progression (G.P.), general term of a G.P., sum of *n* terms of a G.P., infinite G.P. and its sum, geometric mean (G.M.), relation between A.M. and G.M.	To demonstrate that the Arithmetic mean of two different positive numbers is always greater than the Geometric mean.	● Differentiate between sequence and series ● Identify Arithmetic Progression (AP) ● Establish the formulae of finding nth term and sum of *n* terms ● Solve application problems based on AP ● Find arithmetic mean (AM) of two positive numbers ● Identify Geometric Progression (GP)	Students creative thinking skills in solving two dimensional arithmetic series through research based learning	* Exercise Questions & Answers to be assessed * Questions from other reference books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked

				● Derive the *nth* term and sum of n terms of a given GP ● Solve problems based on applications of GP ● Find geometric mean (GM) of two positive numbers ● Solve problems based on relation between AM and GM ● Apply appropriate formulas of AP and GP to solve application problems		
JULY	26	**5. Straight Lines** Brief recall of two-dimensional geometry from earlier classes. Slope of a line and angle between two lines. Various forms of equations of a line: parallel to axis, point -slope form, slope-intercept form, two-	To verify that the equation of a line passing through the point of intersection of two lines $a_1x + b_1y + c_1=0$	● Find the slope and equation of line in various form ● Find angle between the two lines	Understand that a straight line has an angle measurement of 180 degrees	* Exercise Questions & Answers to be assessed

		point form, intercept form and normal form. General equation of a line. Distance of a point from a line. **6. Limits** Intuitive idea of limit. Limits of polynomials and rational functions trigonometric, exponential and logarithmic functions	and $a_2x + b_2y + c_2 = 0$ is of the form $(a_1x + b_1y + c_1) + \lambda (a_2x + b_2y + c_2) = 0$. .	● Find the perpendicular from a given point on a line ● Find the distance between two parallel lines ● Define limit of a function ● Solve problems based on the algebra of limits		* Questions from other reference books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked * Case-study based Questions will be asked
AUGUST	23	**7. Statistics** Measures of Dispersion: Range, mean deviation, variance and standard deviation of ungrouped/grouped data.		● Understand meaning of dispersion in a data set ● Differentiate between range, quartile deviation, mean deviation and standard deviation ● Calculate range, quartile deviation, mean deviation and standard	Statistics skills are capabilities and competency traits that allow someone to use statistics in order to gauge the probability of a particular outcome. Statistics are generally a combination of several qualifying traits, including math, computer	* Exercise Questions & Answers to be assessed * Questions from other reference books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked

				deviation for ungrouped and grouped data set ● Choose appropriate measure of dispersion to calculate spread of data	literacy, data analysis and critical thinking	* Case-study based Questions will be asked
SEPTEMBER	23	**Revision & Half Yearly Exam**				
OCTOBER	16	**8. Trigonometric Functions** Positive and negative angles. Measuring angles in radians and in degrees and conversion from one measure to another. Definition of trigonometric functions with the help of unit circle. Truth of the identity sin2x + cos2x = 1, for all x. Signs of trigonometric functions. Domain and range of trigonometric functions and their graphs. Expressing sin (*x*±*y*) and cos (*x*±*y*) in terms of sin*x*, sin*y*, cos*x* & cos*y* and their simple applications. Deducing identities like the following: tan(x±y)=tanx±tany1∓tanxtany ,cot(x±y)=cot x cot y ∓1coty±cotx sinα±sinβ=2sin12(α±β)cos12(α∓β) cosα+cosβ=2cos12(α+β)cos12(α−β)	To prepare a model to illustrate the values of sine function and cosine function for different angles which are multiples of π and $\frac{\pi}{2}$.	* Identify the hypotenuse, adjacent side and opposite side of an acute angle in a right triangle. Determine the six trigonometric ratios for a given angle in a right triangle. Recognize the reciprocal relationship between sine / cosecant, cosine / secant and tangent / cotangent.	* Trigonometric functions are equal to 0, 1, -1, or undefined when the angle lies on an axis, meaning that the angle is equal to 0°,90°,180° or 270° degrees (0, $\frac{\pi}{2}$, $\frac{3\pi}{2}$ in radian). Trigonometric functions are undefined when they represent fractions with denominators equal to zero.	* Exercise Questions & Answers to be assessed * Questions from other reference books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked * Case-study based Questions will be asked

		$cos\alpha - cos\beta = -2sin\frac{1}{2}(\alpha+\beta)sin\frac{1}{2}(\alpha-\beta)$ Identities related to sin2*x*, cos2*x*, tan2 *x*, sin3*x*, cos3*x* and tan3*x*. **9. Linear Inequalities** Linear inequalities. Algebraic solutions of linear inequalities in one variable and their representation on the number line. Graphical solution of linear inequalities in two variables. Graphical method of finding a solution of system of linear inequalities in two variables	To verify that the graph of a given inequality, say $5x + 4y - 40 < 0$, of the form $ax + by + c < 0$, $a, b > 0$, $c < 0$ represents only one of the two half planes.			
NOVEMBER	19	**10. Permutations & Combinations** Fundamental principle of counting. Factorial *n.* (n!) Permutations and combinations, formula for nPr and nCr, simple applications. **11. Conics** Sections of a cone: circles, ellipse, parabola, hyperbola. Standard equations and simple properties of parabola, ellipse and hyperbola. Standard equation of a circle.	To construct different types of conic sections.	● Define permutation ● Apply the concept of permutation to solve simple problems ● Define combination ● Differentiate between permutation and combination	Arranging people, digits, numbers, alphabets, letters, and colours are examples of permutations. Selection of menu, food, clothes, subjects, the team are examples of combinations.	* Exercise Questions & Answers to be assessed * Questions from other reference books will be done * MCQ based Questions will be asked

				● Apply the formula of combination to solve the related problems Define parabola, ellipse, hyperbola and related terms ● Define eccentricity of a parabola, ellipse and hyperbola ● Derive the equation of parabola , ellipse and hyperbola		* Short & Long type questions will be asked * Case-study based Questions will be asked
DECEMBER	19	**12. Introduction to 3D Geometry** Coordinate axes and coordinate planes in three dimensions. Coordinates of a point. Distance between two points and section formula. **13. Derivatives** Derivative introduced as rate of change both as that of distance function and geometrically. Definition of Derivative, relate it to	To explain the concept of octants by three mutually perpendicular planes in space.	* Find the distance between two points in 3D space * Ratio in which the line is divided in 3D space	Students' critical thinking skills towards the relationship between the concepts of continuity and derivatives of functions	* Exercise Questions & Answers to be assessed * Questions from other reference books will be done

		scope of tangent of the curve, derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric functions.		● Find the derivative of function of a function		* MCQ based Questions will be asked * Short & Long type questions will be asked * Case-study based Questions will be asked
JANUARY	20	**14. Probability** Random experiments; outcomes, sample spaces (set representation). Events; occurrence of events, 'not', 'and' and 'or' events, exhaustive events, mutually exclusive events, Probability of an event, probability of 'not', 'and' and 'or' events.	To write the sample space, when a die is rolled once, twice…	* Different types of events like sure event, impossible event, equally likely event and occurrence of events. Random experiment, outcomes, sample space (set representation including one coin, two coins, three coins, four coins, one die, two dice, playing cards). Mutually exclusive	* It is used in analysing games of chance, genetics, weather prediction, and a myriad of other everyday events. Statistics is the mathematics we use to collect, organize, and interpret numerical data.	* Exercise Questions & Answers to be assessed * Questions from other reference books will be done * MCQ based Questions will be asked * Short & Long type questions will be asked * Case-study based Questions will be asked

				events, exhaustive events, mutually exclusive & exhaustive events. Probability of the events with the special word : ‘not’ ‘or’ ‘and’ ‘at least’ ‘at most’		
FEBRUARY	23	**Revision & Annual Exam**				

Subject Teacher : Madhu Sudan Ghosh **Principal**